Patent claims

1. A method for manufacturing a shape body containing a starch, in particular a soft capsule comprising a capsule content and a one-part capsule casing, wherein the method comprises the following steps

a) conveying a mixture containing at least one starch, preferably in a weight range of 45 to 80% by weight with respect to the total weight of the mixture, water, and at least one organic softener, whilst melting and kneading, into a homogenised thermoplastic molten mass in a first processing means;

b) optionally manufacturing an intermediate storable product, in particular a granulate, after cooling down the homogenised molten mass and subsequent by melting the intermediate product in a second processing means;

c) manufacturing at least one material ribbon, in particular an extruded film, at the exit of the first or where appropriate second processing means,

d) re-shaping the material ribbon into a shape body in a continuous or intermittent shaping method;

e) optionally appropriate drying the shape body,

wherein the steps a) to c) are carried out in a manner such that in step d) the value of the limiting viscosity index of the mass forming the material ribbon is at least 40 ml/g, preferably of at least 50 ml/g and even more preferred of at least 60 ml/g.

2. A method according to claim 1, wherein the mixture applied in step a) additionally contains an inert lubricant and releasing agent which is selected from the group consisting of lecithins, monoglycerides, diglycerides or triglycerides of nutrient fatty acids, in particular glycerine monostearate, polyglycerine ester of nutrient fatty acids, polyethylene ester of nutrient fatty acids, sugar ester of nutrient fatty acids and nutrient fatty acids, pyrrolidones.

3. A method according to claim 2, wherein the mixture contains glycerine monostearate and lecithin in a weight ratio of 1:1.5, preferably of 1:1.2 and even more preferably of 1:1.

4. A method according to claim 1, wherein the mixture comprises the organic softener in a range of at least 12% by weight of the weight of the starch in a water free condition, preferably in a range of between 30% by weight to 50% by weight and even more preferably in a range of between 38% by weight to 45% by weight.

5. A method according to claim 4, wherein the softener is replaced by water, wherein the replacement is carried out in the ratio of 2 parts softener : 1 part water and the minimum content of softener is 12% by weight with respect to the weight of water-free starch.

6. A method according to claim 1, wherein step a) to c) are performed at a predeterminable temperature, the temperature of the molten mass in the steps a) to c) is not exceeding 160°C, preferably not exceeding 120°C and even more preferable not exceeding 90°C.

7. A method according to claim 1, wherein steps a) to c) are performed at a predeterminable kneading energy, the energy of the steps a) to c) does not exceed 0.3 kWh/kg, preferably not 0.2 kWh/kg and even more preferred not 0.175 kWh/kg

8. A method according to claim 1, wherein at least the melting in the first processing means is effected in an equal rotating double-worm extruder and that individual sections of the extruder with respect to the longitudinal direction of the worms are heated to different temperatures.

9. A method according to claim 1, wherein in step c) the material ribbon is extruded as a flatly guided film which is stored with intermediate layers of anti-sticking material preferably as rolls and at a later point in time shaped into shape parts, in particular capsule casings.

10. A method according to claim 1, wherein the re-shaping in step d) includes two homogenous material films which in a usual encapsulation process, in particular the rotary die method, are shaped to soft capsules comprising a one-part capsule casing, whereby and joining together and filling of the capsule casing is effected in one working step.

11. A method according to claim 1, wherein the material ribbon in step c) is extruded in a tubing-shaped film, the tubing said film is then slit and is processed further in step d) as a flatly guided film.

12. A homogenised starch-containing mass, containing preferably at least 45% by weight of an amorphous starch with an amylopectine content of greater or equal to 50% by weight with respect to the weight of the starch in water-free condition,

water, at least one organic softener in at least 12% by weight with respect to the weight of the water-free starch, wherein the limiting viscosity index of the homogenised mass is at least 40 ml/g, preferably at least 50 ml/g and even more preferably at least 60 ml/g.

13. A homogenised mass according to claim 12, wherein the mass additionally contains a lubricant and releasing agent which is selected from the group consisting of lecithins, monoglycerides, diglycerides, and triglycerides of nutrient fatty acids, in particular glycerine monostearate, polyglycerine esters of nutient fatty acids, polyethylene esters of nutrient fatty acids, sugar esters of nutrient fatty acids and nutrient fatty acids.

14. A homogenised mass according to claim 12, wherein the softener is selected from the group consisting of polyalcohols, in particular glycerine, organic acids, hydroxy acids, amines, acid amides and sulphoxides, pyrrolidones.

15. A homogenised mass according to claim 13, wherein the mass contains glycerine monostearate and lecithin in a weight ratio of 1:1.5, preferably 1:1.2 and even more preferred 1:1.

16. A homogenised mass according to claim 12, wherein the mass additionally contains an aggregate in a weight range of 3.5% by weight to 15% by weight with respect to the total weight of the mass, preferably of 5% by weight to 8% by weight, wherein the aggregate is selected from the group consisting of carbonates and/or hydrogen carbonates of alkali and/or earth alkali ions, preferably calcium carbonate, amylases, further decomposing agents, colourings, preservatives, anti-

oxidants, physically and/or chemically modified biopolymers and vegetable polypeptides.

17. A shape body, in particular a soft capsule casing, manufactured from a mass according to claim 12 and/or according to a method according to claim 1.

18. A shape body, in particular soft capsule casing, according to claim 17, wherein the shape body has an elongation at rupture of at least 100%, preferably at least 160% and even more preferred 240%, at 25°C and 60% relative air humidity.

19. A shape body, in particular soft capsule casing according to claim 17, wherein the shape body at 25°C and 60% relative air humidity has a strength σ_m of at least 2 MPa, preferably a strength in the range of 3.5 MPa to 8 MPa and even more preferred from 4 MPa to 6.5 MPa.

20. A shape body according to claim 17, wherein the shape body is a soft capsule and that the capsule casing comprises a thickness in the region between 0.1 and 2 mm, preferably between 0.2 and 0.6 mm.

21. A shape body, in particular soft capsule casing, according to claim 17, wherein the shape body consists of a multi-layered film and that at least two of the films have a different chemical composition.

22. A device for manufacturing a soft capsule from a mass according to claims 12 in a method according to claim 1, consisting of a one-part capsule casing and a capsule content, wherein the capsule casing is shaped in a shaping method from at least two web-like films at a filling and shaping station and

is provided with a capsule content, wherein at least two web-like films are manufacturable in in each case one extruder arranged next to the filling and shaping station, and the web-like films are directly introducable into the filling and forming station for manufacturing the soft capsule.